A

Zone 1:   codons 1 to 10

	1	2	3	4	5	6	7	8	9	10	
L	*RNT*	*NAS*	*RNT*	*NAS*	*NAS*	*NYC*	*RNT*	*RNA*	*RNT*	*RNT*	(SEQ ID NO. 139)
i	A	D	A	D	D	A	A	A	A	A	
b	D	E	D	E	E	F	D	E	D	D	
r	G	H	G	H	H	I	G	G	G	G	
a	I	K	I	K	K	L	I	I	I	I	
r	N	N	N	N	N	P	N	K	N	N	
y	S	Q	S	Q	Q	S	S	R	S	S	
	T	Y	T	Y	Y	T	T	T	T	T	
	V		V			V	V	V	V	V	
w t	*GCC*	*GAG*	*GGT*	*GAC*	*GAT*	*CCC*	*GCA*	*AAA*	*GCG*	*GCC*	(SEQ ID NO. 140)
	A	E	G	D	D	P	A	K	A	A	(SEQ ID NO. 141)
1 a	*GAT*	*AAG*	*AGT*	*GAG*	*AAG*	*TTC*	*GCT*	*AGA*	*GAT*	*GCT*	(SEQ ID NO. 142)
	D	K	S	E	K	F	A	R	D	A	(SEQ ID NO. 143)
1 b	*AAT*	*AAG*	*GAT*	*GAG*	*CAG*	*TTC*	*GCT*	*AGA*	*GCT*	*GCT*	(SEQ ID NO. 144)
	I	K	D	E	Q	F	A	R	A	A	(SEQ ID NO. 145)
1 c	*ATT*	*TAC*	*ATT*	*AAG*	*GAG*	*ACC*	*AGT*	*AAA*	*AAT*	*GCT*	(SEQ ID NO. 146)
	I	Y	I	K	E	T	S	K	N	A	(SEQ ID NO. 147)
1 d	*AAT*	*TAC*	*GTT*	*GAC*	*CAG*	*GTC*	*AGT*	*AAA*	*AAT*	*GCT*	(SEQ ID NO. 148)
	N	Y	V	D	Q	V	S	K	N	A	(SEQ ID NO. 149)
1 e	*GCT*	*AAG*	*GCT*	*GAG*	*GAG*	*TTC*	*GCT*	*GAA*	*GCT*	*GCT*	(SEQ ID NO. 150)
	A	K	A	E	E	F	A	E	A	A	(SEQ ID NO. 151)
1 f	*GCT*	*GAC*	*ATT*	*GAC*	*GAC*	*TTC*	*GCT*	*AGA*	*AGT*	*GCT*	(SEQ ID NO. 152)
	A	D	I	D	D	F	A	R	S	A	(SEQ ID NO. 153)

Figure 1A

B

Zone 2: codons 11 to 20

Library	11 NWT	12 NAS	13 RNT	14 NYT	15 NAS	16 RNT	17 RNT	18 RNT	19 RNT	20 NAS	
	D	D	A	A	D	A	A	A	A	D	(SEQ ID NO. 154)
	F	E	D	F	E	D	D	D	D	E	
	H	H	G	I	H	G	G	G	G	H	
	I	K	I	L	K	I	I	I	I	K	
	L	N	N	P	N	N	N	N	N	N	
	N	Q	S	S	Q	S	S	S	S	Q	
	V	Y	T	T	Y	T	T	T	T	Y	
	Y		V	V		V	V	V	V		

	11	12	13	14	15	16	17	18	19	20	
wt	TTT	AAC	TCC	CTG	CAA	GCC	TCA	GCG	ACC	GAA	(SEQ ID NO. 155)
	F	N	S	L	Q	A	S	A	T	E	(SEQ ID NO. 156)
2a	TAT	GAG	GCT	CTT	GAG	GAT	ATT	GCT	ACT	AAC	(SEQ ID NO. 157)
	Y	E	A	L	E	D	I	A	T	N	(SEQ ID NO. 158)
2b	TAT	GAG	GCT	CTT	GAG	GAT	ATT	GCT	ACT	AAC	(SEQ ID NO. 159)
	Y	E	A	L	E	D	I	A	T	N	(SEQ ID NO. 160)
2c	TAT	GAG	GCT	CTT	GAG	GAT	ATT	GCT	ACT		N (SEQ ID NO. 161)
	Y	E	A	L	E	D	I	A	T		N (SEQ ID NO. 162)
2d	TAT	GAC	GTT	CTT	CAG	ATT	GCT	GCT	ATT		AAC(SEQ ID NO. 163)
	Y	D	V	L	Q	I	A	A	I		N (SEQ ID NO. 164)
2e*	CTT	AAG	GAT	CTT	AAG	GCT	ACT	GTT	ATT		CAG(SEQ ID NO. 165)
	L	K	D	L	K	A	T	V	I		Q (SEQ ID NO. 166)
2f*	TAT	GAG	ACT	ATT	AAG	GAT	GAT	ATT	GTT		AAG(SEQ ID NO. 167)
	Y	E	T	I	K	D	D	I	V		K (SEQ ID NO. 168)
2g*	CTT	CAG	AAT	ATT	CAC	AGT	AGT	ATT	AGT		AAG(SEQ ID NO. 169)
	L	Q	N	I	H	S	S	I	S		K (SEQ ID NO. 170)
2h*	TAT	AAG	ACT	GTT	CAG	GGT	GCT	ATT	GCT		AAG(SEQ ID NO. 171)
	Y	K	T	V	Q	G	A	I	A		K (SEQ ID NO. 172)
2i*	TAT	AAG	ACT	ATT	AAG	AGT	ATT	GCT	AAT		AAG(SEQ ID NO. 173)
	Y	K	T	I	K	S	I	A	N		K (SEQ ID NO. 174)
2j*	TAT	TAG	AGT	CTT	CAG	ATT	ATT	GCT	GCT		CAG(SEQ ID NO. 175)
	Y	Q	S	L	Q	I	I	A	A		Q (SEQ ID NO. 176)
2k*	TTT	CAG	AGT	CTT	AAG	GAT	ACT	GCT	GAT		GAG(SEQ ID NO. 177)
	F	Q	S	L	K	D	T	A	D		E (SEQ ID NO. 178)
2m*	TTT	GAG	AAT	CTT	TAG	GCT	ACT	ATT	ACT		AAG(SEQ ID NO. 179)
	F	E	N	L	Q	A	T	I	T		K (SEQ ID NO. 180)

Figure 1B

C

Zone 3: codons 21 to 30

	21	22	23	24	25	26	27	28	29	30
L	*NWC*	*NWC*	*NKT*	*NWC*	*NYT*	*NKG*	*NYT*	*NKG*	*NWT*	*NWT* (SEQ ID NO. 181)
i	D	D	C	D	A	G	A	G	D	D
b	F	F	F	F	F	L	F	L	F	F
r	H	H	G	H	I	M	I	M	H	H
a	I	I	I	I	L	R	L	R	I	I
r	L	L	L	L	P	V	P	V	L	L
y	N	N	R	N	S	W	S	W	N	N
	V	V	S	V	T		T		V	V
	Y	Y	V	Y	V		V		Y	Y

	21	22	23	24	25	26	27	28	29	30
w t	*TAT*	*ATC*	*GGT*	*TAT*	*GCG*	*TGG*	*GCG*	*ATG*	*GTT*	*GTT* (SEQ ID NO. 182)
	Y	I	G	Y	A	W	A	M	V	V (SEQ ID NO. 183)
3a	*CTT*	*TTC*	*TTT*	*CTC*	*CTT*	*GGG*	*ACT*	*GTG*	*CAT*	*CTT* (SEQ ID NO. 184)
	L	F	F	L	L	G	T	V	H	L (SEQ ID NO. 185)
3b	*TAC*	*TAC*	*CTT*	*AAC*	*ATT*	*TTG*	*GCT*	*GTG*	*TAT*	*GTT* (SEQ ID NO. 186)
	Y	Y	L	N	I	L	A	V	Y	V (SEQ ID NO. 187)
3c	*TTC*	*ATC*	*CGT*	*GTC*	*ACT*	*TGG*	*ACT*	*ATG*	*TAT*	*GTT* (SEQ ID NO. 188)
	F	I	R	V	T	W	T	M	Y	V (SEQ ID NO. 189)
3d	*GTC*	*ATC*	*CGT*	*TAC*	*GTT*	*ATG*	*TCT*	*ATG*	*TAT*	*GTT* (SEQ ID NO. 190)
	V	I	R	Y	V	M	S	M	Y	V (SEQ ID NO. 191)

Figure 1C
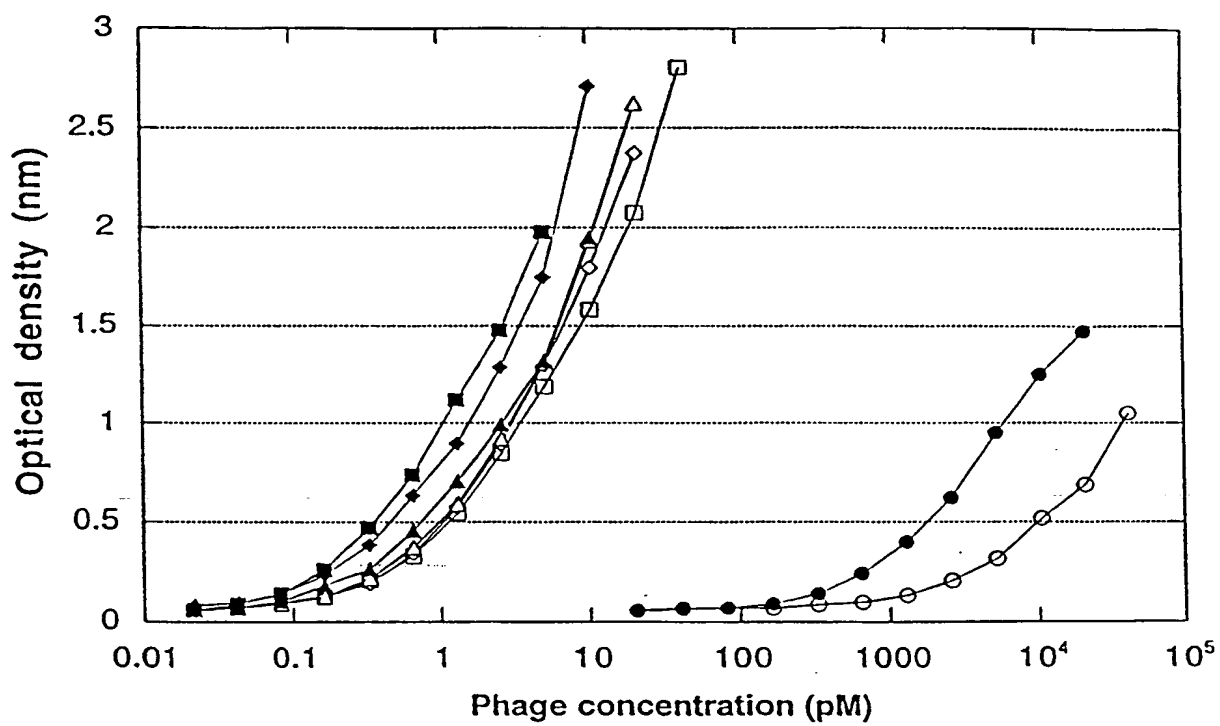
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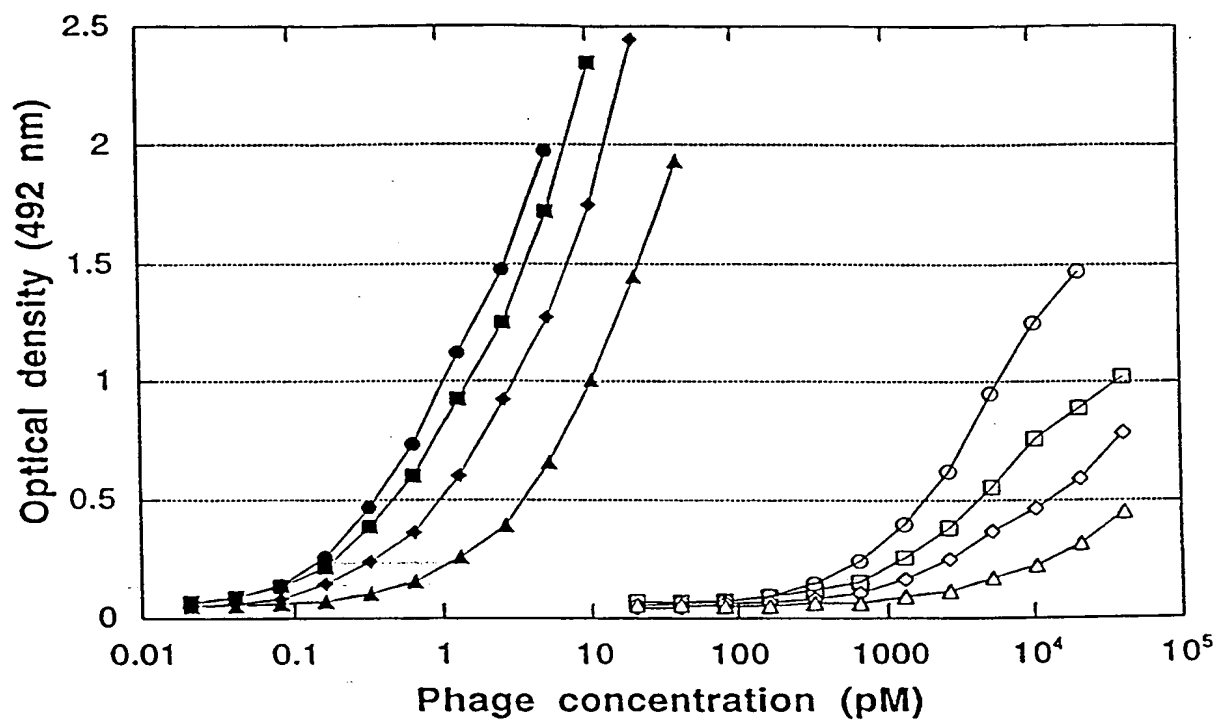
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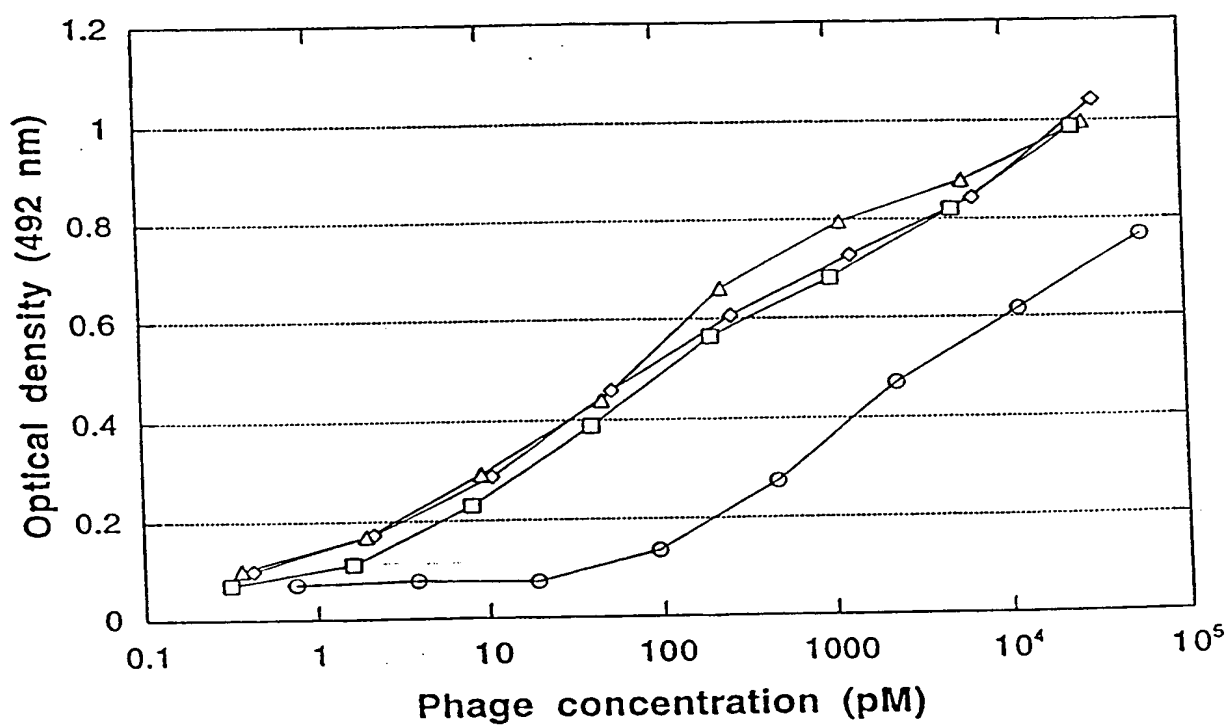
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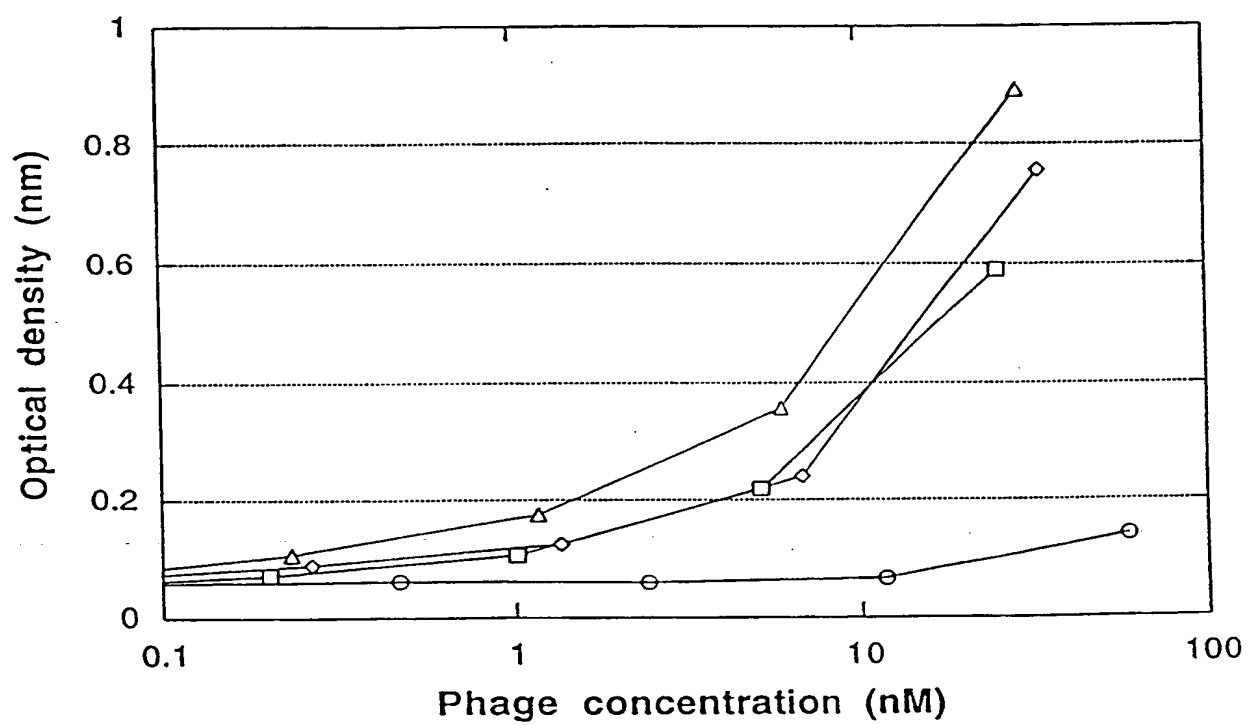
Figure 4B

Figure 5

Figure 6

A

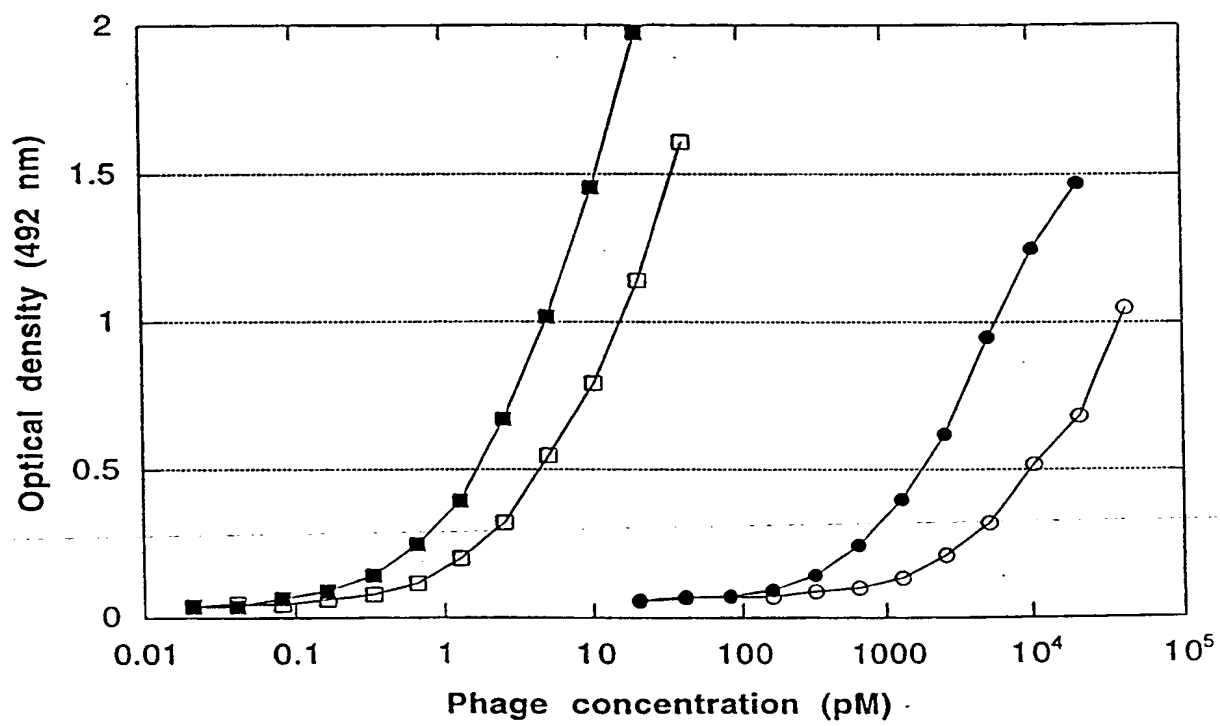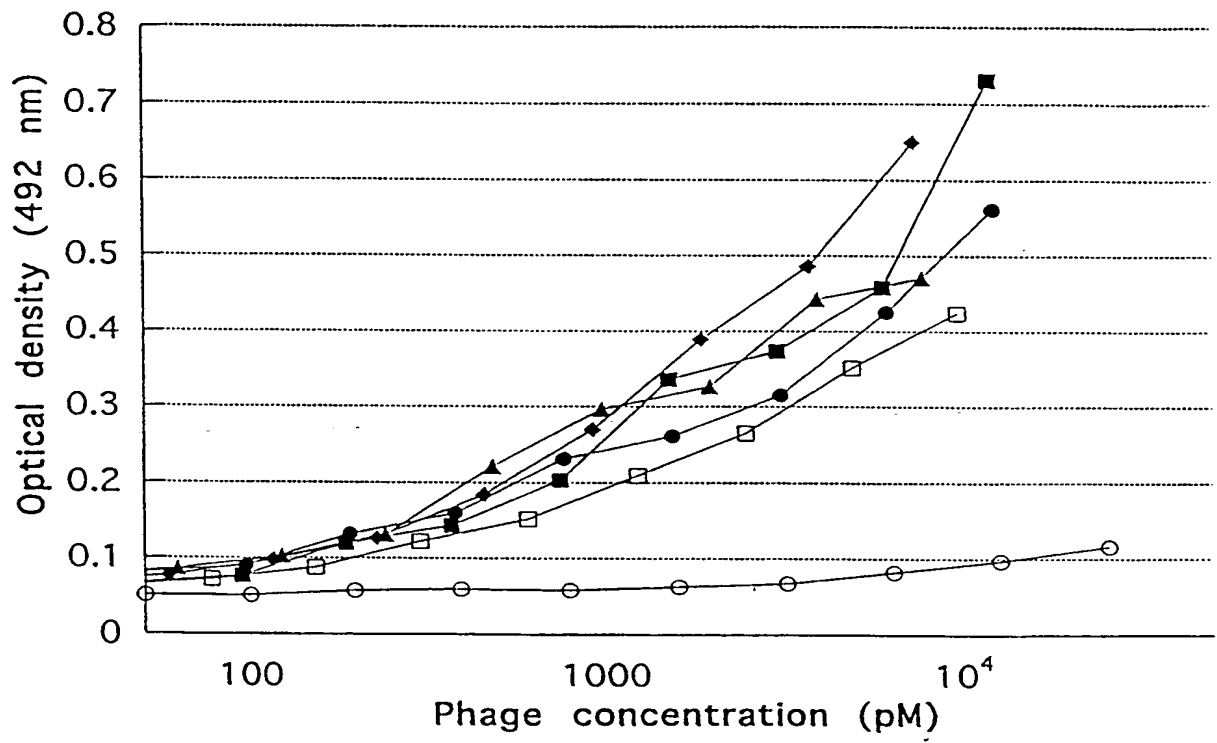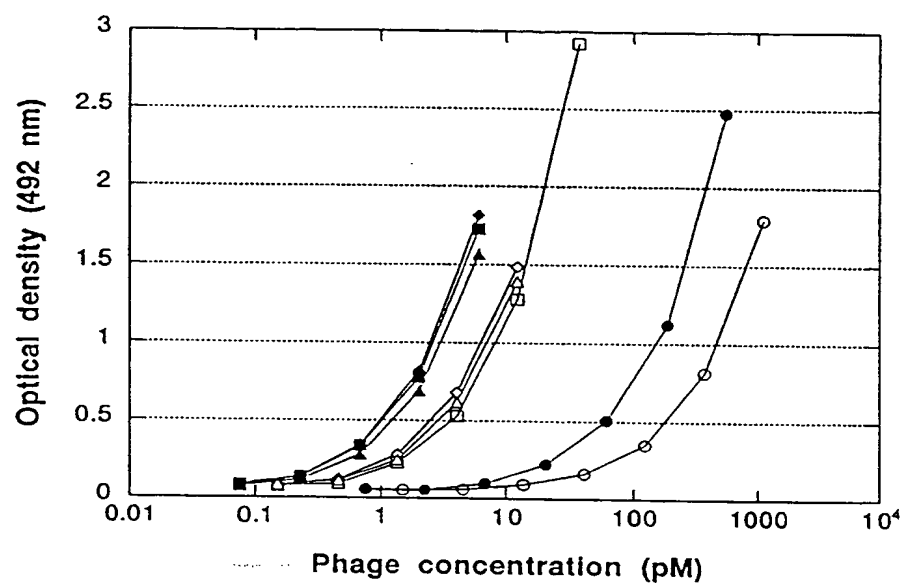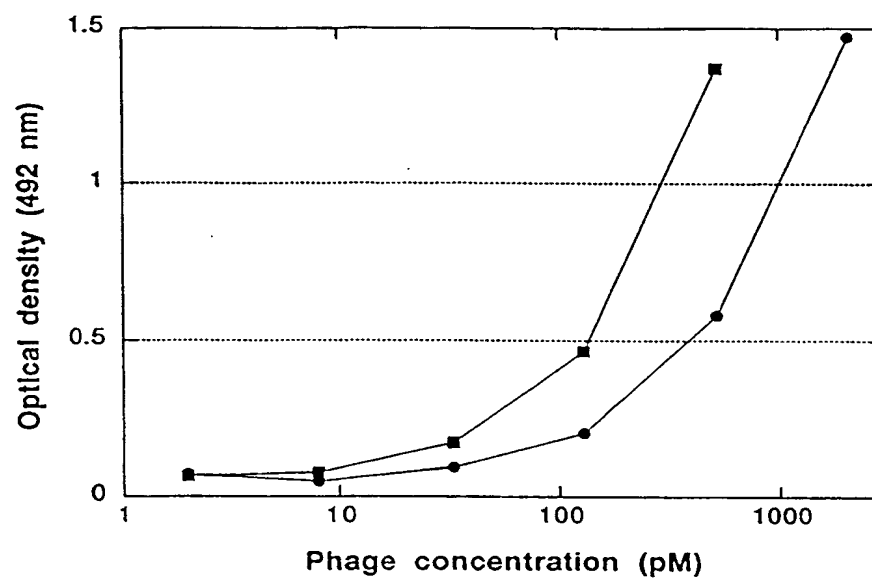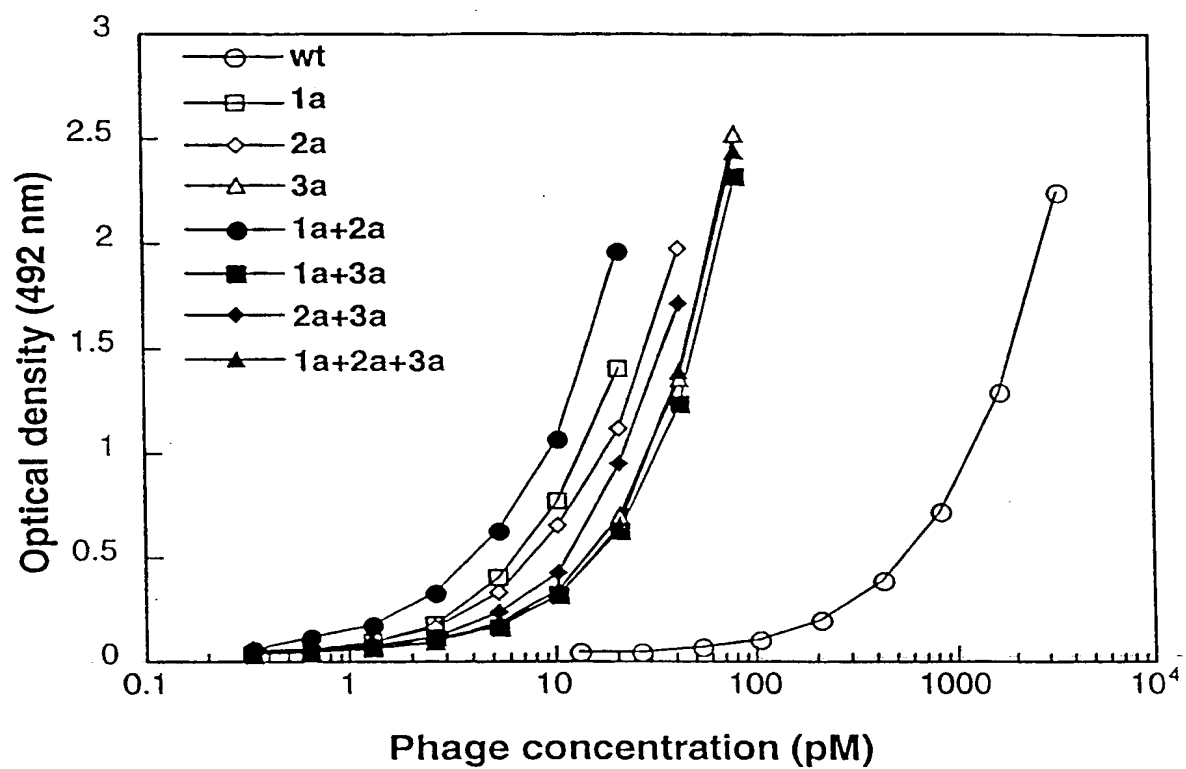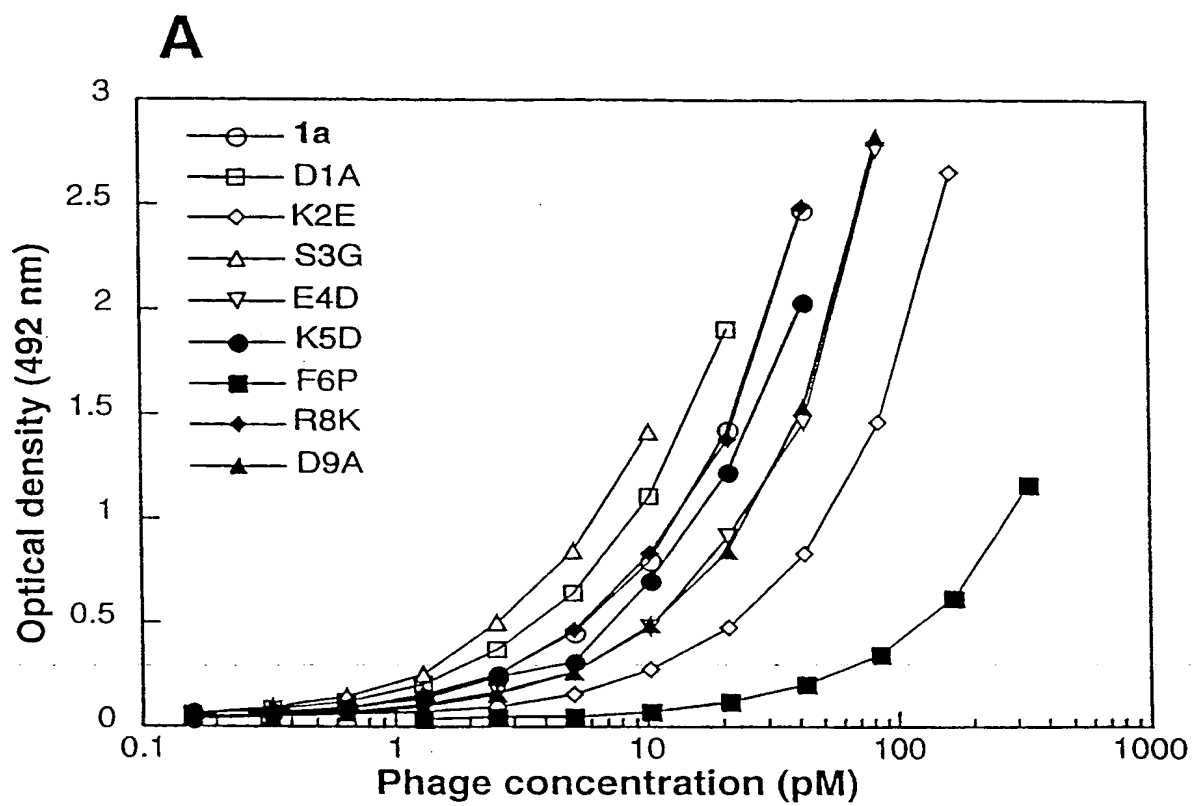|	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Link1	GAC	GCC	AGC	AAC	AGC	ACC	CAC	GCC	CAC	GCC	CAC	AAC	GCC	GCC	(SEQ ID NO. 192)
	D	G	S	N	S	T	H	P	H	R	H	N	R	R	(SEQ ID NO. 193)
Link2	ACC	GCC	GCC	CAC	GCC	AAC	GAC	AAC	GAC	GCC	GCC	CAC	GCC	GCC	(SEQ ID NO. 194)
	T	A	R	H	A	N	D	N	D	G	A	H	R	R	(SEQ. ID NO. 195)
Link3	ACC	CAC	GCC	AAC	GCC	GCC	AAC	GCC	GCC	GCC	GCC	GCC	GCC	GCC	(SEQ ID NO. 196)
	T	H	P	N	P	R	N	A	A	G	P	A	P	G	(SEQ ID NO. 197)
Link4	CAC	GCC	AAC	GCC	ACC	GAC	GCC	GCC	GCC	GCC	GCC	GCC	GCC	CAC	(SEQ ID NO. 198)
	H	R	N	G	T	D	P	G	G	P	R	A	R	H	(SEQ ID NO. 199)
Link5	GCC	GCC	GCC	GAC	ACC	ACC	GCC	CAC	GCC	CAC	ACC	CAC	GCC	CAC	(SEQ ID NO. 200)
	A	P	R	D	T	T	A	H	R	H	T	H	R	H	(SEQ ID NO. 201)
Link6	GCC	GCC	AGC	GCC	GCC	AGC	GCC	AAC	ACC	AAC	GAC	GCC	CAC	GAC	(SEQ ID NO. 202)
	P	R	S	A	R	S	R	N	T	N	D	R	H	D	(SEQ ID NO. 203)
Link7	ACC	GCC	GCC	GAC	GCC	AGC	AGC	AAC	GAC	GCC	CAC	GCC	GCC	ACC	(SEQ ID NO. 204)
	T	A	P	D	R	S	S	N	D	A	H	A	P	T	(SEQ ID NO. 205)
Link8	GCC	AGC	GCC	AGC	AAC	GCC	GCC	GCC	GCC	ACC	GCC	GCC	GCC	ACC	(SEQ ID NO. 206)
	G	S	P	S	N	P	G	A	R	T	R	A	G	T	(SEQ ID NO. 207)
Link9	GCC	CAC	GCC	GCC	CAC	GCC	CAC	GCC	GCC	GCC	CAC	GCC	GCC	GCC	(SEQ ID NO. 208)
	G	H	A	G	H	P	H	R	P	R	H	P	A	R	(SEQ ID NO. 209)

Figure 7A

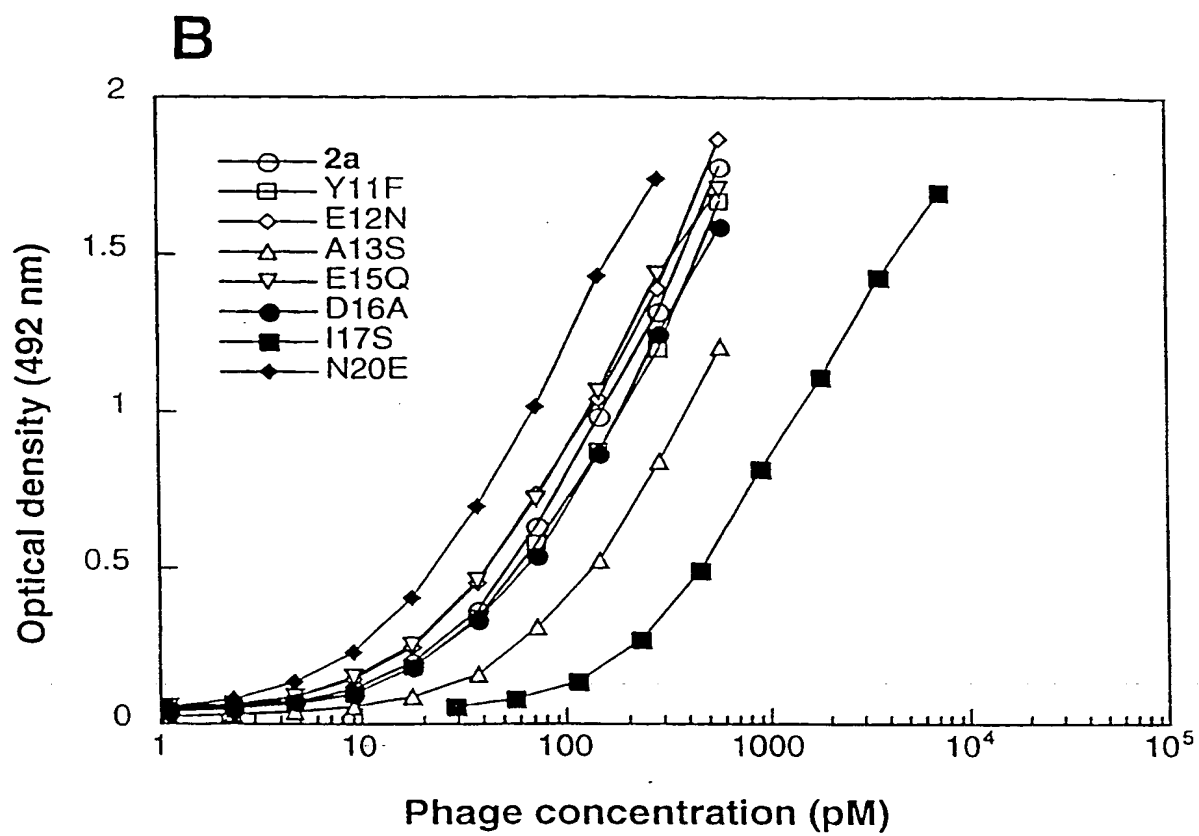Figure 7B

Figure 8A

Figure 8B

Figure 9

Figure 10

Figure 11

Figure 12A

Figure 12B
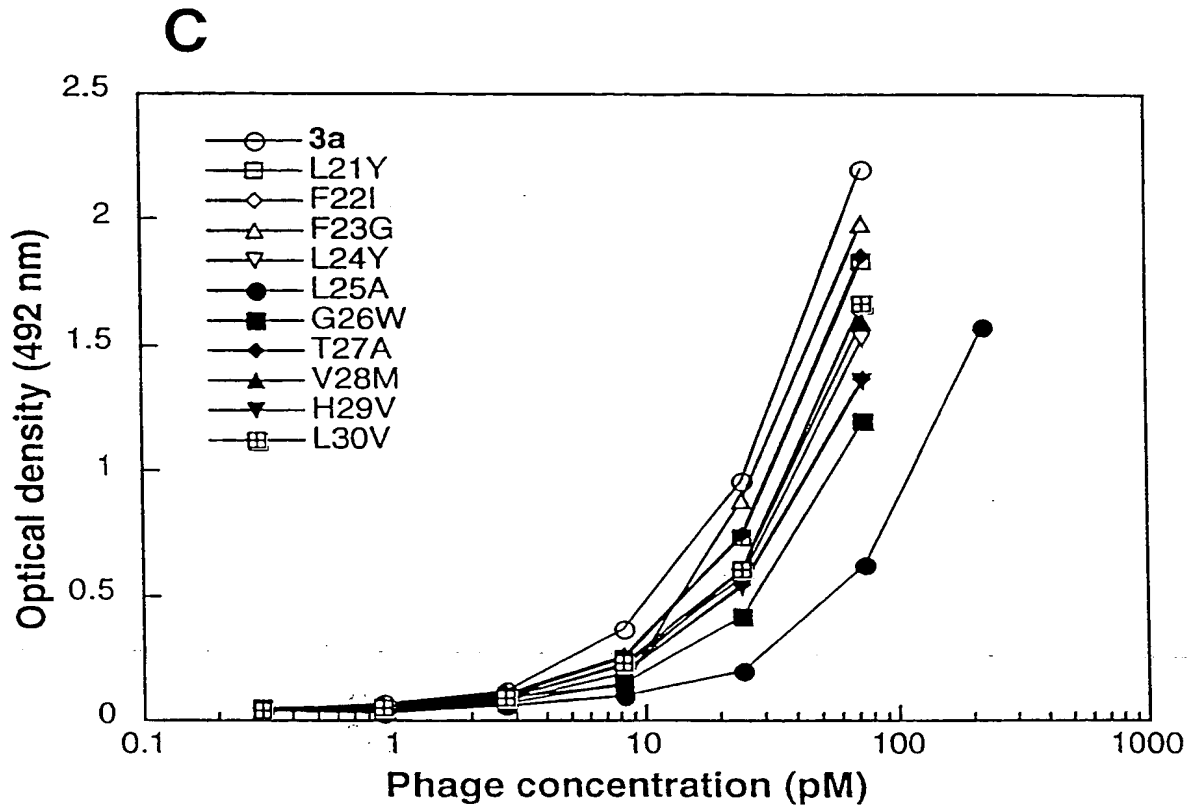
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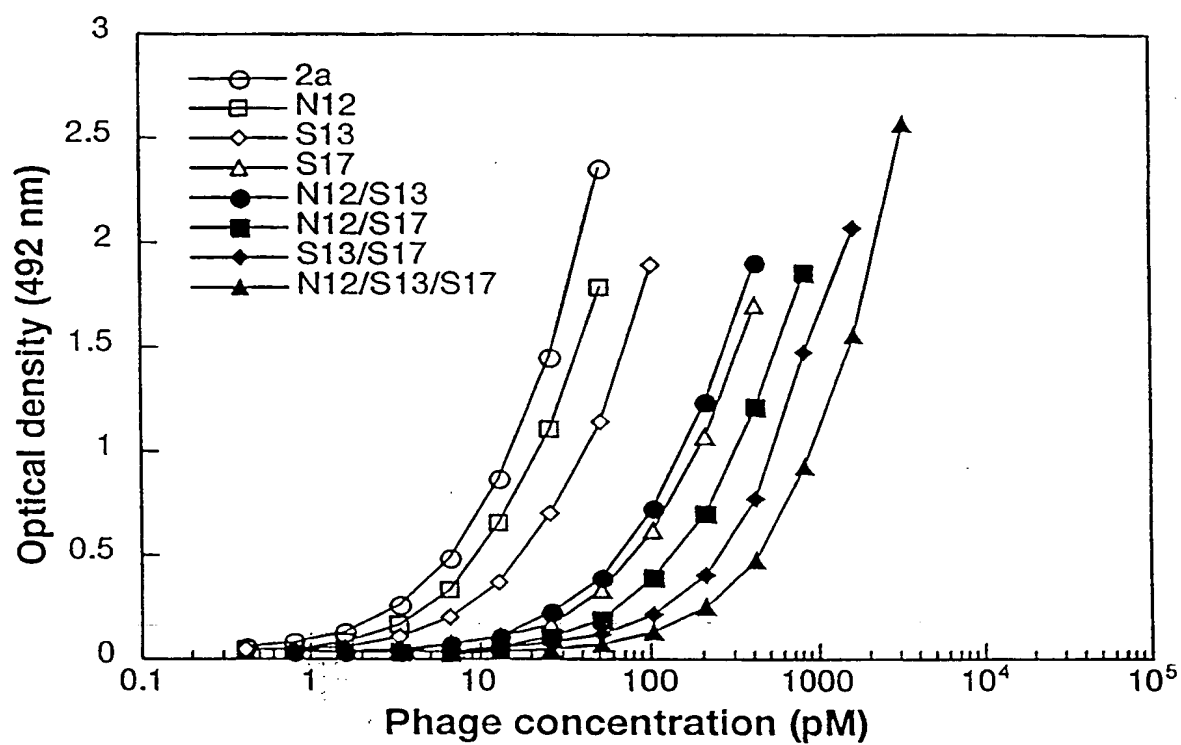
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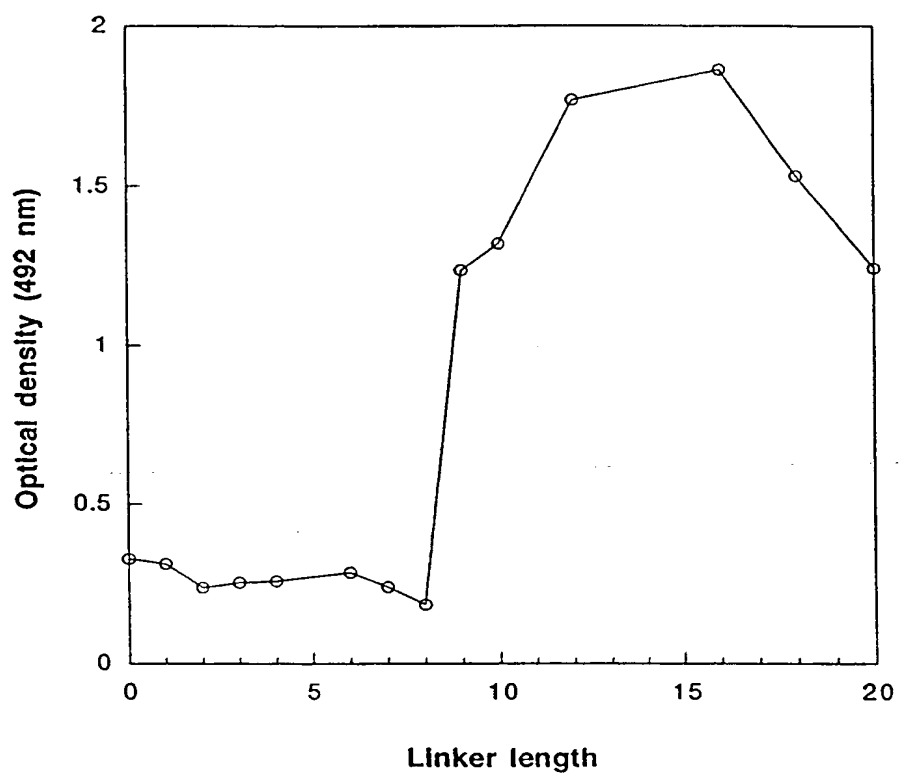
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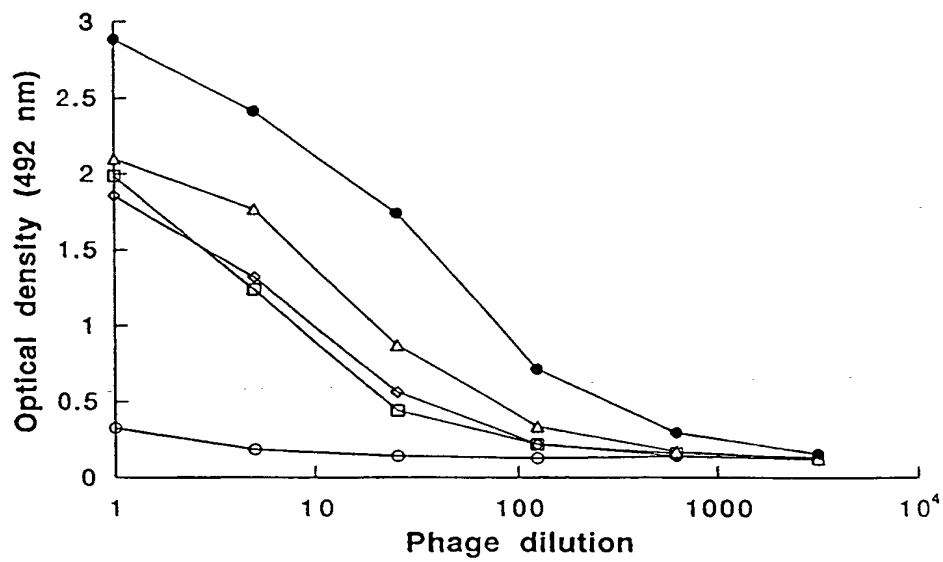
Figure 14

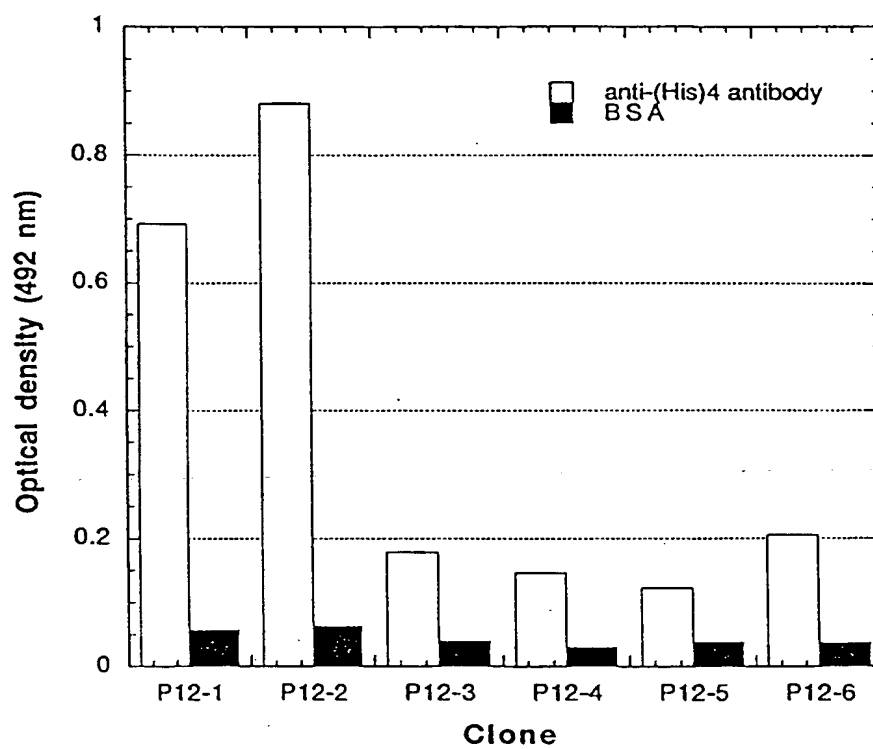|	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	NWT	NKT	NWT	NYT	NYT	NKT	NWT	NWT	NWT	NWT	NWT	NKG	NYT	NKG	NYT	NWC	NKT	NWT	NWT (SEQ ID NO. 266)
L	F	F	F	F	F	F	F	F	F	F	F	L	F	L	F	F	F	F	F
I	L	L	L	L	L	L	L	L	L	L	L	M	L	M	L	L	L	L	L
B	I	I	I	I	I	I	I	I	I	I	I	V	I	V	I	I	I	I	I
R	V	V	V	V	V	V	V	V	V	V	V	W	V	W	V	V	V	V	V
A	N	C	N	S	S	C	N	N	N	N	N	R	S	R	S	Y	C	N	N
R	H	R	H	P	P	R	H	H	H	H	H	G	P	G	P	H	R	H	H
Y	N	S	N	T	T	S	N	N	N	N	N		T		T	N	S	N	N
	D	G	D	A	A	G	D	D	D	D	D		A		A	D	G	D	D
P12-1	GTT V	TTT F	GTT V	TTT F	TCT S	GTT V	GAT D	GTT V	GAT D	AAT N	AAT N	TGG W	ATT I	TGG W	GCT A	GTC V	GGT G	ATT I	GTT (SEQ ID NO. 267) / V (SEQ ID NO. 268)
P12-2	CAT H	AGT S	CTT L	GCT A	GTT V	ATT I	GAT D	GAT D	AAT N	TTT F	TAT Y	TGG W	GTT V	GGG G	TTT F	TAC Y	GGT G	TAT Y	GTT (SEQ ID NO. 269) / V (SEQ ID NO. 270)
P12-3	CTT L	TTT F	TAT Y	CCT P	GTT V	AGT S	GTT V	CAT H	ATT I	GTT V	ATT I	CGG R	TTT F	TTG L	TCT S	CTC L	TTT F	CTT L	GTT (SEQ ID NO. 271) / V (SEQ ID NO. 272)
P12-4	CTT L	AGT S	GTT V	GTT V	GTT V	CGT R	GAT D	CTT L	ATT I	TAT Y	AAT N	GTG V	GTT V	ATG M	TTT F	CAC H	GTT V	GTT V	AAT (SEQ ID NO. 273) / N (SEQ ID NO. 274)
P12-5	CTT L	GGT G	TTT F	TCT S	ACT T	CGT R	GTT V	CTT L	GTT V	GAT D	GAT D	TGG W	CTT L	ATG M	GTT V	AAC N	AGT S	TTT F	GAT (SEQ ID NO. 275) / D (SEQ ID NO. 276)
P12-6	TAT Y	TTT F	CTT L	GCT A	TTT F	AGT S	ATT I	ATT I	GAT D	CTT L	TTT F	AGG R	CTT L	TGG W	CTT L	TAC Y	TTT F	GTT V	AAT (SEQ ID NO. 277) / N (SEQ ID NO. 278)

Figure 15

Figure 16

Figure 17

Figure 18